



LECTURE SERIES

6

FEEDING MORE PEOPLE AND BETTER IN WEST AFRICA: THE CASE OF BENIN

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INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE



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IFPRI Lecture Series 6

Feeding More People and Better in West Africa: The Case of Benin

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Lecture presented November 30, 1998
International Food Policy Research Institute
Washington, D.C.

Foreword

In this lecture, Moïse C. Mensah traces the recent history of economic policy in Benin and examines how Benin can meet food security needs while overcoming the challenges posed by a growing population, fragile natural resource base, and constraints on productivity.

Although the gap between food supply and demand is not significant in Benin, about a third of the population is food insecure because of regional differences in food production and lack of income. The growth in population means that Benin's food requirements will double in volume by 2020, possibly increasing the food-insecure share of the population. To help make the Beninese food secure, Mensah suggests that several steps be taken in three areas: agricultural and rural development, agricultural research, and regional cooperation. These steps include faster decentralization of government in order to empower local communities, improvement of infrastructure and rural services, enhancement of market efficiency, promotion of income generation in rural areas, improvement in the link between farmers' needs and research themes and extension packages, strengthening of the capability for food policy analysis and research, and better integration of Benin into regional marketing and cooperation.

Per Pinstrup-Andersen
December 1999

Feeding More People and Better in West Africa: The Case of Benin

Moïse C. Mensah

The International Food Policy Research Institute's 2020 Vision initiative has been providing us with enlightened guidance on the steps we must take if we want to witness a significant if not total eradication of hunger and malnutrition within the next generation. By we, I mean policymakers at both national and international levels, scientists, development thinkers and practitioners, and all citizens of the world who do not accept the increasing gap between the wealthy and the poor, the gap between what we know can be done to feed the poor and the little we are doing to meet those needs.

The IFPRI lecture series on food, agriculture, and the environment provides a forum for reflection on these and related issues, and I am honored to take part in this event. I wish to thank IFPRI for inviting me to deliver this year's lecture. I shall attempt to describe how Benin, a West African country, is facing the challenge of having to feed a growing population in a sustainable way on a relatively fragile natural resource base. In so doing, I shall look at Benin's food needs and assess the means available to reach food delivery targets in an efficient, sustainable, and socially acceptable manner. I shall also raise a few policy issues that must be addressed to achieve success.

BENIN: IDENTITY CARD

The Republic of Benin is one of the 16 member countries of the Economic Community of West African States (ECOWAS), which contains 235 million inhabitants and stretches from Mauritania to Nigeria over an area of 6.1 million square kilometers.

Moïse C. Mensah has been a national and international policymaker for many years. He has served as minister of rural development in his native Benin, assistant director general for Africa at the Food and Agriculture Organization of the United Nations, and assistant president of the International Fund for Agricultural Development. He recently served as the minister of finance in Benin. Mensah is a member of IFPRI's 2020 Vision International Advisory Committee.

Geographical Profile

Benin covers 113,000 square kilometers and has a population close to 6 million. The country looks like a 700-kilometer-long corridor linking the Atlantic Ocean in the south to River Niger in the north. The landscape is generally flat with the exception of the Atacora Plateau in the northwest, which reaches up to 800 meters high. Rainfall varies between 900 millimeters and 1,450 millimeters per year, and the temperature ranges between 22° and 37° Celsius under shelter.

With the exception of a few pockets of forest areas and mangroves, the vegetation is of a savannah type. The soils are sandy along the coast and largely ferralitic in the other areas, with tracks of vertisols in river valleys. The arable land amounts to 70,500 square kilometers, of which only 15 percent are exploited.

Sociocultural and Political Background

Benin is a multiethnic society with three major groups of languages. The common denominator among the Beninese population is the importance attached to the family cell as a production, consumption, and social integration unit. With continuing economic changes, however, the extended family is being replaced by a nuclear family module, especially in the fast-expanding urban areas.

Benin became an independent state in 1960 and has since experienced a wide spectrum of political systems, beginning with liberal democracy and then returning to it after 17 years of Marxism-Leninism. The latter regime failed economically but it enhanced people's political awareness without affecting their devotion to religion and deep attachment to private ownership. The multiparty democracy that now prevails in Benin seems to be working to the satisfaction of the majority.

Economic Profile

Benin has witnessed two major economic phases in recent years. The first phase, severe economic crisis, lasted from 1985 to 1990. The second, recovery, phase began in 1990.

The crisis phase developed as a consequence of the government's decision to apply Marxist-Leninist precepts to governance, including the management of economic and social development. All large- and medium-scale enterprises were nationalized. So was the banking system. Prevailing rules and regulations left little room to the private sector. State-owned trading companies were established.

The omnipotence of the public sector led to the massive recruitment of civil servants far beyond the capacity of the national budget. At the same time, the poorly managed public enterprises accumulated severe losses,

compelling the government to provide substantial subsidies to keep them afloat. The banking system collapsed completely. For its survival, Beninese society reacted by vigorously expanding and diversifying the activities of the informal sector.

To put the economy back on track the government decided to undertake a structural adjustment program in collaboration with the International Monetary Fund and the World Bank. The program began in 1989 and is currently in its third stage. The first two stages aimed at restoring the viability of public finances and the balance of payments, keeping the rate of increase of domestic prices and costs low, and enhancing the acceleration of economic growth. The third stage adds a significant social dimension, consisting of the protection of vulnerable groups and the promotion of human resources.

So far the results of the adjustment program have been encouraging. The rate of growth of gross national product (GNP), which was 2.7 percent per year between 1985 and 1990, rose to 4.5 percent between 1990 and 1997. The program has had a positive impact on the evolution of government expenditures and revenues, the privatization of public enterprises, and the recovery of the banking system, which is now healthy and expanding.

The Rural Sector

The rural sector, which includes agriculture, animal husbandry, fisheries, and forestry, provides occupation to 56 percent of Benin's active population and accounts for 36 percent of GNP.

From 1960 to 1975 agricultural development policies and programs accorded priority to the promotion of export crops, mainly cotton and oil palm. From 1975 to 1985, policymakers emphasized self-sufficiency in food and the supply of raw materials to local industries. Subsequently the government sought to expand both the food- and export-crop sectors.

The agricultural growth rate has risen from 4.8 percent during the period 1985–90 to 5.5 percent during 1991–97. The government, which devotes 24 percent of public investment to agriculture, has redefined its role in that sector, making a progressive transfer of relevant economic functions to the private sector.

The most significant jump in agricultural output has come from cotton production, which rose from 162,000 metric tons in 1992–93 to 350,000 metric tons in 1996–97. Producers can thank institutional reforms in the cotton subsector, price incentives, and revenue redistribution measures for this spurt.

Benin's main food crops include cereals and roots and tubers. Maize is the main cereal crop, with annual production of 497,000 metric tons in 1995, corresponding to a yield of 1,019 kilograms per hectare. Sorghum is second (112,000 metric tons, with a yield of 776 kilograms per hectare).

Rice production is making progress in both output (14,600 metric tons in 1996 compared with 8,845 metric tons in 1990) and yield (1,550 kilograms per hectare in 1997 compared with 1,300 kilograms in 1990).

Yams lead the roots and tubers group, with a production level of 1,225,000 metric tons (11 tons per hectare yield) followed by cassava (1,094,000 metric tons output, 8.5 tons per hectare yield). Other food crops include grain legumes, groundnuts, and a variety of vegetables and tropical fruits.

On the livestock front, Beninese animal husbandry involves over 1 million head of cattle raised predominantly in the northern part of the country. Sheep, goats, and pigs are raised as well, although pigs were decimated by pests in 1997. Benin produces about 30,000 metric tons of meat, 40,000 metric tons of milk, and 20,000,000 eggs a year. Animal production is characterized by low labor productivity and a limited number of market-oriented enterprises.

There are two main sources of fishery products: marine fisheries, which yield an average of 10,000 metric tons per year, and land fisheries, which produce 30,000 metric tons. Marine fisheries are constrained by limited natural resources and equipment, while the output of inland waters is handicapped by siltation, overexploitation, and pollution by floating weeds.

BALANCING FOOD NEEDS AND SUPPLY

Food Balance Sheet: The Current Picture

Most of the calories and nutrients Beninese consume come from vegetal sources. Benin is self-sufficient in maize, yams, cassava, and groundnuts, but not in millet, sorghum, rice, and cowpeas (Table 1).

The analysis of the food situation by region shows that the deficit at the national level for millet and sorghum stems from inefficient production in the two major producing and consuming regions (Atacora and Borgou). Yet those two regions were able to deliver excess production of maize to the Atlantique and Mono regions, which are traditional producers and consumers of that commodity. This interregional trade reflects a new trend in the production pattern of the northern savannah areas, which are seizing market opportunities and diversifying production.

The positive national balance for maize represents only 4.5 percent of consumption, whereas the national balance for cassava amounts to a comfortable 13.7 percent of consumption. Yam production exceeds consumption by 65.9 percent. On the deficit side, domestic production of rice covers only 14 percent of consumption.

If one compares the staple food balance sheets for 1996/97 and 1997/98 (Tables 1 and 2; see Table 3 for an aggregate picture), the similarity in the

Table 1—Production minus consumption of staple foods in Benin, 1997/98

Crop	Region				
	Atacora	Atlantique	Borgou	Mono	Oueme
				(metric tons)	
Maize	17,280	-76,708	68,553	-21,294	19,214
Millet/sorghum	-19,633	0	-4,778	0	0
Rice	-4,499	-16,906	-8,404	-9,718	-13,839
Yams	131,253	-11,704	286,287	2,252	27,808
Cassava	51,274	82,779	15,785	-55,103	506,622
Cowpeas	-2,084	-7,087	-7,745	673	-2,543
Groundnuts	-3,628	-2,019	5,793	-632	-5,273
					9,608
					3,849

Source: Office National de Sécurité Alimentaire (ONASA)/Centre d'Action Régional du Développement Rural (CARDER), Ministère du Développement Rural, Benin.

Table 2—Production minus consumption of staple foods in Benin, 1996/97

Crop	Region						
	Atacora	Atlantique	Borgou	Mono	Oueme	Zou	Benin
	(metric tons)						
Maize	19,655	-85,528	63,456	-15,462	-10,452	9,862	-18,468
Millet/sorghum	-15,535		-8,458			3,148	-20,847
Rice	-4,483	-16,315	-9,065	-8,880	-13,346	-9,894	-61,982
Yams	158,296	-11,295	341,772		16,581	-51,279	453,076
Cassava	76,012	58,978	10,447	-46,021	413,298	216,918	729,632
Cowpeas	-1,500	-7,098	-8,385	816	-1,922	5,593	-12,496
Groundnuts	-3,600	-2,045	5,418	-1,038	-4,315	11,313	5,733

Source: Office National de Sécurité Alimentaire (ONASA)/Centre d'Action Régional du Développement Rural (CARDER), Ministère du Développement Rural, Benin.

Table 3—Comparison of food balances in 1996/97 and 1997/98

Region/measure	Cereals			Tubers			Legumes		
	1996/97	1997/98	Percent change	1996/97	1997/98	Percent change	1996/97	1997/98	Percent change
Atacora									
Hectares	106,237	102,403	-3.61	49,984	49,607	-0.75	26,051	24,937	-4.28
Metric tons	97,682	94,444	-3.61	618,979	568,547	-8.15	20,641	21,184	2.63
Atlantique									
Hectares	89,978	111,839	24.30	31,969	35,918	12.35	9,748	11,649	19.50
Metric tons	82,909	100,813	21.59	217,302	250,829	15.43	5,851	6,645	13.57
Borgou									
Hectares	197,213	208,562	5.75	75,527	74,037	-1.97	42,414	45,215	6.60
Metric tons	197,846	212,109	7.21	678,997	608,707	-10.35	34,781	37,055	6.54
Mono									
Hectares	75,227	69,099	-8.15	22,902	21,298	-7.01	22,285	24,174	8.48
Metric tons	58,203	53,397	-8.26	139,606	134,989	-3.31	12,674	13,874	9.47
Oueme									
Hectares	159,230	193,309	21.40	59,169	69,855	18.06	27,416	23,784	-13.25
Metric tons	154,021	197,423	28.18	630,991	750,313	18.91	18,877	17,215	-8.81
Zou									
Hectares	85,860	96,841	12.79	76,632	75,004	-2.12	75,284	91,720	21.83
Metric tons	75,155	83,546	11.17	614,465	590,041	-3.97	54,478	59,097	8.48
Benin									
Hectares	713,745	782,053	9.57	316,183	325,718	3.02	203,198	221,479	9.00
Metric tons	665,816	741,732	11.40	2,900,340	2,903,426	0.11	147,302	155,070	5.27

Source: Office National de Sécurité Alimentaire (ONASA)/Centre d'Action Regional du Développement Rural (CARDER), Ministère du Développement Rural, Benin.

staple food supply picture suggests several research and policy issues. Yams could play a greater role in meeting food needs through appropriate processing and preservation. There is room for expanding rice production to a significant extent. About 60,000 hectares of suitable land are available for this purpose. Grain legumes have a low profile in the food basket. Indeed, the evolution of per capita staple food production from 1993 to 1997 shows a decline of grain legume production from 37.4 kilograms per capita to 26.7 kilograms (Table 4). The production of cereals seems to hover around 128 kilograms and that of roots and tubers rises from 448 kilograms to reach 518 kilograms per capita. The decline in grain legume productivity is due mainly to the lack of cost-effective pest control packages that can protect cowpeas and other legumes against their numerous parasites.

Providing Food for the Next Generation

The 1992 census recorded a population size of 4.9 million inhabitants. The census also showed a life expectancy of 54.2 years, an infant mortality rate of 162 per thousand, an average of 6.1 children per adult woman (at age 50), an average family size of 5.9 persons, a ratio of women-headed households amounting to 21 percent of total households, and an urban population ratio of 36 percent. Women account for 51.3 percent of the total population.

The overall population is increasing at the rate of 2.8 percent per year. By 2020 10.5 million people will be living in Benin. All other things being equal, the food requirements by 2020 also will be about twice the current volume. Other factors, especially health status and income levels, could raise demand further.

The population of Benin suffers from tropical transmissible and parasitic diseases. The relatively rapid population growth of 2.8 percent makes it hard to provide adequate health services at a satisfactory pace. The coverage rate of medical staff, for example, is still far below World Health Organization (WHO) norms. The country has 1 doctor for 19,617 inhabitants, compared with the WHO recommendation of 1 per 10,000. One midwife assists 12,504 women, whereas the WHO norm is 1 per 5,000. Under its five-year development program the government is vigorously trying to improve the coverage of health services by recruiting additional staff under specific contracts to assist the neediest communities. The construction of health centers is expanding, especially in rural areas. The supply of drinking water is improving. Other positive factors include the development of a private medical sector, the upgrading of traditional medicine, and the emergence of cooperative health insurance schemes.

Unless attitudes toward family size change significantly, the efforts being made to improve health may result in a population even larger than the 10.5 million forecast for 2020.

Table 4—Aggregate and per capita staple food production, 1993–97

Year	Population	Cereals		Tubers		Legumes	
		Metric tons	Kilograms per capita	Metric tons	Kilograms per capita	Metric tons	Kilograms per capita
1993	5,079,000	654,676	128.8	2,275,792	448.07	190,094	37.42
1994	5,247,000	642,837	122.1	2,443,403	465.67	142,667	27.19
1995	5,422,000	602,386	111.1	2,559,472	472.05	140,460	25.9
1996	5,604,000	665,816	118.5	2,900,340	517.55	147,302	26.28
1997	5,795,000	741,732	128.0	2,903,426	518	155,070	26.75

Source: Office National de Sécurité Alimentaire (ONASA)/Centre d'Action Régional du Développement Rural (CARDER), Ministère du Développement Rural, Bénin.

Income determines the quality and quantity of food consumed by a person, a family, and the nation as a whole. The aggregate food supply at the national level may be sufficient to feed the entire population and yet some segments of the population may not have adequate access to food because of lack of income.

In Benin, the inability to purchase adequate food manifests itself in urban as well as rural areas. In urban areas, unemployment is the main cause of inadequate income levels. Unemployment was particularly severe during the initial years of the structural adjustment program, when the government had to lay off thousands of civil servants, adding to the many jobless people, especially young graduates and school-leavers. In order to reduce unemployment the government launched the Highly Labor Intensive Public Works scheme (TUHIMO) in the main cities. This scheme continues as part of the social dimension of structural adjustment. In rural areas, some farming communities do not always produce enough to meet their basic food needs, let alone enough to buy additional food and meet other essential requirements. To ensure a sustainable income base for rural communities, the government launched an Income-Generating Activities project (PAGER) in 1995. This project recognizes gainful employment and income as the key to eradicating rural poverty and ensuring food security. It promotes microeconomic initiatives on an individual and collective basis. It should go a long way toward increasing rural family income, especially for women, who tend to direct more household resources toward improving the nutrition status of the family. We know that “no mother who has money in her purse would allow her child to go to bed with an empty stomach” (stated by a rural women’s group leader at a recent meeting on poverty eradication in Natitingou, northwest Benin).

Moreover, the nation’s economic growth rate has averaged 4.5 percent over the 1991–97 period. It was 5.5 percent in 1996 and is expected to be 6.2 percent in 1998 and 6.7 percent in 2002. If current efforts to reach those targets are pursued in parallel with employment creation through private, small- and medium-scale enterprises, additional income should be available to boost household consumption. That would affect the quantities as well as the quality of food required.

Because of its geographic position Benin is a regional crossroad and a transit country. It belongs to two regional economic unions: the Economic and Monetary Union of West Africa (UEMOA), comprising eight states that share the same currency, are close to establishing a customs union, and belong to a larger union of 16 countries, ECOWAS. ECOWAS is also taking important steps toward regional economic integration, especially with respect to the free movement of goods and services and the creation of a larger customs union within the next few years.

Looking at its most immediate neighbors, Benin has a market of over 100 million consumers in Nigeria and bordering Sahelian countries, which suffer periodically from drought and food shortages and must draw on the Beninese food basket to meet their own needs. Therefore, to ensure adequate food supply to the population of Benin, farmers must produce significantly more than required by domestic demand.

Such indeed has been the pattern, although it has not precluded the importation of some food items, especially from Nigeria, when the currency exchange rate has favored the Beninese. Demand for staple foodstuffs produced in Benin has also been increasing in the foreign subregion far beyond neighboring countries. While this situation leads to strong inflationary pressure on domestic prices and occasionally to organized importation, foreign demand should also be seen as an opportunity to expand production.

For Benin to seize such an opportunity, however, its food production and supply system must be competitive. That is a basic requirement for two main reasons. First, because ECOWAS offers an integrated economic space, other farming communities will be keen to compete in the food market. Second, the new rules of the World Trade Organization call for global competition and the dismantling of protectionist barriers.

IMPROVING THE FOOD SUPPLY SYSTEM

To improve the food supply system, constraints to land and labor productivity, adequate food processing and preservation, and food distribution and consumption must be addressed.

Constraints to Land and Labor Productivity

Soil fertility. The depletion of soil nutrients makes it impossible to realize the potential of existing crop varieties that are well adapted to local conditions. Varieties of maize are available that can yield four metric tons per hectare against the current average of one ton. Likewise 20 to 28 tons of cassava roots can be obtained against the current yield of 8.5 tons per hectare. The restoration of the fertility level is a major precondition for taking full advantage of yield potential. The cost of imported fertilizers and other inputs, given CFA currency devaluation, also becomes an issue for achieving maximum yields. A plant nutrient supply package that combines nutrients produced on the farm with purchased inputs may go a long way toward mitigating cost and maintaining soil fertility at the required level. Some steps are being taken along this line in Benin.

Land degradation. Land degradation can be observed throughout the country's farmlands, especially in the cotton-producing areas in the northern savannah belt. Rapid growth in cotton production came partly from a significant expansion of cultivated area at the expense of a scarce and valuable natural population of trees and shrubs. As a result, the land has been severely eroded and floods are becoming a recurrent phenomenon during the rainy season. Proposed corrective measures include partial reforestation, introduction of agroforestry practices, and a combination of a cotton acreage ceiling and more productive technical packages.

Water management. Because traditional Beninese agricultural practice has not included irrigation, more than 300,000 hectares of irrigable lands are left idle, even though their use could provide a substantial amount of food and allow less suitable land currently under cultivation to be used for forestry or environmental conservation purposes.

On-farm equipment. Except for the few fruit and vegetable growers, the return per man-day of labor input is low for the majority of small farmers who still work with hand tools. The promotion of animal traction, which is spreading in the cattle-raising northern provinces, provides the beginnings of a solution. Similar or alternative means must be developed for the south.

Lack of access to appropriate financial services. This seriously limits the ability of the rural poor, especially women, to seize commercial opportunities. Existing commercial banks are far too distant from rural financial markets. The FECECAM (agricultural cooperative credit union) network is not yet reaching disadvantaged producers. In spite of their diversity and their adaptation to the conditions of the poorest segments of the rural population, informal financial systems remain insecure, expensive, and limited in their volume of operations. And the centralized financial systems established within various projects, including nongovernmental organization (NGO) projects, have restricted coverage. Therefore, a real need exists for creating local financial enterprises that are able to provide a large spectrum of services and easy access to the rural poor, particularly women (IFAD 1990). The government has just launched a microfinance and a commercialization project to address this issue.

Dissemination of technological information and know-how. In its efforts to streamline the civil service, the government significantly reduced the size of the agricultural extension staff, but subsequent contractual arrangements have limited the negative impact. The quality of the extension

messages and the manner in which they are conveyed, however, remain a matter of concern to farmers, who want to have more say in the determination of the research themes that produce the eventual extension messages. Farmers also want to play an active part in the evaluation of the technological packages offered, so as to amend them and thereby propose new research topics. Participation at these levels is also a necessary part of the farmer's training process.

Constraints to Adequate Food Processing and Preservation

Agro-industrial enterprises have been expanding their activities and providing processed food items mainly to urban areas. Most of the population in rural Benin depends on locally processed food items. These processing activities are carried out largely by women who cannot increase the quantity and improve the quality of their output unless equipped with more labor- and energy-efficient equipment. The government, along with NGOs, is promoting the adoption of improved processing equipment used in neighboring and other developing countries. Energy to run this equipment will have to come from village woodlots, biogas, and solar energy. The expansion of drinkable water supply schemes is also needed to facilitate food processing. The lack of low-cost storage facilities that are easy to manage and effective in minimizing crop losses is another serious constraint to food preservation.

Constraints to Food Distribution and Consumption

High transaction costs of agricultural commodities constitute the main constraint to food distribution and consumption. These costs can be traced to (1) inadequate road links, which make access to marketplaces difficult, (2) poor access to commercial information, (3) the multiplicity of actors along the commercial chain, each of them handling small quantities of products, (4) the heterogeneity of the norms and practices associated with weight measures and packaging, (5) postharvest losses, and (6) unlawful levy of fees by corrupt public agents dealing with transportation control.

The government's efforts to mitigate high transaction costs places special emphasis on improving road networks, mainly feeder roads, and fighting malpractice in transport control. New rural development projects can also assist traders of agricultural produce—most of whom are women—by supporting grassroots efforts to improve the capacity of commercialization systems to be self-financing and sustainable.

MORE FOOD ON A SUSTAINABLE BASIS

Nutritional Requirements

Data from the 1992–94 FAO (Food and Agriculture Organization of the United Nations) food balance sheets show that Beninese have 2,325 calories available per capita per day, 57.4 grams of protein, and 44.8 grams of fat. Vegetal sources provide 95.3 percent of the calories, 81.3 percent of the protein, and 85.9 percent of the fat (Table 5).

The nutritional requirements recommended for Benin by the National Food and Nutrition Directorate (DANA) are 2,400 calories, 60 grams of protein, and 60 grams of fat per day. The gap between the recommendations and reality is not significant under present population and food production circumstances, although it should be noted that the average figures hide regional and social discrepancies. Eleven out of a total of 78 districts show chronic food deficits. A 1995 survey by INSAE, the National Institute of Statistics and Economic Analysis, reveals that 17 percent of the rural population lives below the extreme poverty threshold of 38,800 CFA per capita per year, which means that they are unable to meet basic food requirements. Thirty-three percent of the rural population lives below the general poverty threshold of 56,600 CFA, unable to meet basic nonfood requirements. In urban areas the ratios are 30 percent and 33 percent respectively, and at the national level the figures are 19.5 percent and 33.7 percent.

If no qualitative changes occur in the contribution of staple foods to total calorie intake, and population increases to 10.5 million, projection of staple food requirements for the year 2020 would show the need for 1.4 millions metric tons of cereals; 5.0 million metric tons of roots and tubers; 151,000 metric tons of grain legumes; 500,000 metric tons of oilseeds; 542,000 metric tons of vegetables; and 355,000 metric tons of fruit. These figures mean doubling the production of food crops over the period 1992–94 to 2020.

The magnitude of the necessary increases in staple food production due only to population growth presents a serious challenge. The issues that need to be addressed if Beninese are to have a sustained supply of food cover a wide range.

A quick look at the statistical data in Table 6 may suggest that food production growth has been able to match the population growth over the past four years, at least as far as major staple foods are concerned. However, a number of factors temper optimism. First, the increases in production are due to the expansion of area under cultivation. Second, the production increase has been disappointing for some crops even on the expanded areas. For example, the 3 percent increase in area under root and tuber cultivation produced only a 0.1 percent increase in total output, while the 9 percent

Table 5—Daily per capita calorie, protein, and fat available in selected African countries

Energy source	Benin	Burkina Faso	Cameroon	Côte d'Ivoire	Kenya	Mali	Morocco	Nigeria	Tunisia	South Africa
Calories (kilocalories)										
Vegetable origin	2,217	2,370	2,034	2,253	1,672	1,840	2,904	2,507	2,894	2,412
Animal origin	108	99	132	104	245	199	210	81	273	365
Total	2,325	2,470	2,167	2,356	1,916	2,039	3,114	2,588	3,167	2,776
Protein (grams)										
Vegetable origin	46.7	66.4	39.3	38.5	34.3	42.5	69.9	48.7	64.6	47.3
Animal origin	10.6	7.0	11.2	10.1	15.4	15.2	14.3	6.9	18.2	23.5
Total	57.4	13.4	50.5	48.6	49.7	57.7	84.2	55.6	82.8	70.8
Fat (grams)										
Vegetable origin	38.5	43.9	37.2	37.7	28.8	33.8	46.3	52.2	74.3	43.6
Animal origin	6.3	6.6	8.2	5.7	14.5	11.9	14.9	5.5	17.4	26.8
Total	44.8	50.5	45.3	43.4	43.3	45.7	61.2	57.7	91.7	70.4

Source: FAO 1992-94.

Table 6—Growth rates in staple food production and population, 1993–94 to 1996–97

Year	Population growth	Growth of cereal production	Growth of tuber production	Growth of legume production
(percent)				
1993–94	3	–1.8	7.4	–25
1994–95	3	–6	4.7	–1.5
1995–96	3	1.5	13.3	4.8
1996–97	3	11.4	0.11	5.27

Source: Office National de Sécurité Alimentaire (ONASA)/Centre d'Action Régional du Développement Rural (CARDER), Ministère du Développement Rural, Bénin.

increase in grain-legume-producing area yielded only a 5.3 percent increase in production. The low yields indicate instability in output due to the fragility of the production systems and high dependence on rainfall coupled with poor water management and moisture control.

The more population pressure and demand for food grow, the greater the risk that area expansion will lead to mining of the land and irreversible degradation of the natural resource base. These consequences can be prevented only if food production systems are adjusted to natural resource preservation requirements. This holds true even though only 15 percent of the arable land of Benin is said to be cultivated. Benin is a country with old human settlements and it is clear that settlers have selected what their experience has shown them to be the optimum living and production environment. Continuing expansion of cultivated areas at the current pace will only lead to abuse of suboptimal land that the collective wisdom has left for livestock production, forest, and game reserve purposes.

Reconciling Food Production Increase with the Preservation and Enhancement of the Natural Resource Base

There are two sets of issues related to the need to meet food requirements in a sustainable way: those at the farm level and those at the village and watershed level. At the farm level the preservation of the natural resource base calls for the solution of two key interrelated problems: (1) soil infertility, that is, the replenishment of soil nutrients and organic matter, and (2) soil erosion, which causes substantial loss of topsoil.

If expansion of cultivated area must be limited, the only real option left is to increase productivity per unit of land. This must be coupled with an

increase in labor productivity because a minimum level of net income is necessary for investing in soil fertility improvement.

Research and extension services have on-shelf technological packages that can address those concerns for the immediate future. However, these packages often do not suit the socioeconomic conditions of farming communities (for example, the division of labor between men and women, the availability of manpower at the farm level if children must go to school, access to credit, and transaction costs of commodities). It has become obvious that the research themes that lead to the design of technological packages must be discussed with farmers. To that end the link between the national research institute, public extension services, and farmers, and the growing intermediary role of NGOs, are the order of the day.

Rural Benin is witnessing a fast-expanding movement of farmers' organizations that are claiming more say in agricultural and rural development policy formulation. The coming years should see the strengthening of those organizations, especially women's groups. Women will be playing an increasingly important role in the food production chain, particularly in the areas of commercialization and processing.

At the village and watershed level the main concern is the effective and durable functioning of the ecosystem on a number of levels: providing noncultivated food, especially fruits and vegetables; generating fuelwood and timber, pharmaceutical plants, and various raw materials; protecting useful biological agents such as insects that perform essential functions in plant pollination or biological pest control; storing water; protecting farmland and villages against soil erosion and flooding; and preserving the microclimate.

In many regions the low output on farms and the lack of satisfactory nonfarm income-generating activities have led farming communities to tap aggressively the food and nonfood resources available around them. Village landscapes and watersheds have been degraded as a result and ecosystems have been unable to function properly. The public authorities and much of the population have recognized the risks involved in continuing the degradation process. To reverse the process a natural resource management project (PGRN) has been recently initiated. Its beginnings look promising. The project elicits the participation of the people concerned to ensure that collective discipline governs the use of areas to be farmed, the decisions about areas where trees can be exploited, and the control of game hunting. By improving the farming system and making local communities responsible for resource management, the project will protect natural resources as a reservoir of additional goods. Government will be saving surveillance costs and limiting corrupt practices.

Policy Implications

The challenge of providing an adequate food supply on a sustainable basis to the growing population of Benin calls for policy measures on three fronts: (1) agricultural and rural development activities, (2) agricultural research, and (3) regional cooperation.

Agricultural and rural development activities. Government must fully implement the decisions taken within the framework of structural adjustment that aim to transfer key agricultural development functions to the private sector. These functions essentially include input supply and agricultural commodity marketing, in which small farmers are keen to play a greater role.

The process of decentralizing governance should be accelerated to empower local communities to plan, mobilize financial resources for, and implement their own rural development programs so as to provide basic goods and services to all. Such programs must give special attention to road infrastructure, water supply, health centers, primary schools, rural credit facilities, and collective management of natural resources.

The regulations, standards, and measures that hamper the establishment of competitive food marketing systems must be reviewed and corrected.

Adequate steps must also be taken to speed the implementation and expansion of the recently initiated income-generating activities project to ensure a broad and early impact on food consumption.

The currently applied agricultural extension methodologies must be reviewed in close collaboration with farmers' groups and other NGOs to improve the dialogue between researchers, extension workers, and farmers, thereby ensuring that research themes and extension packages are relevant to the needs of agricultural producers. To this end, traditional communication systems should be studied.

The recognition of the important and growing role played by women in the rural communities should be translated into measures that identify and address their specific needs.

Agricultural research. Government should maintain the emphasis on food-based production systems as prescribed by the national agricultural research master plan. Research on water management as well as natural resources management must be given greater attention in order to provide more effective support to ongoing projects.

Food policy research must be enhanced as well. The agricultural research master plan has introduced an innovation into the traditional research agenda in Benin by adding an agricultural policy analysis program. According to the master plan, "The essential role of the agricultural policy

analysis program will be to determine the bottlenecks in development strategies through the analysis of agricultural policy instruments, and provide decision makers with detailed information on which to base their actions. The objective of the program is to assist in understanding the behavior of the agricultural sector within a context of economic and institutional change. This program takes into account national development objectives as well as the needs of the user" (INRAB 1996).

The agricultural policy analysis program determined that seven main policy instruments apply to Benin: (1) macroeconomic policy, (2) price policy, (3) credit policy, (4) research policy, (5) transfer of knowledge, (6) the structure of the rural society, and (7) land tenure policy.

The program also identified 22 research themes out of which 7 were selected as priority topics: (1) the impact of agricultural finance policies, (2) the input supply and distribution circuits, (3) the socioeconomic and cultural constraints on the adoption of technology, (4) economic analysis of preservation and packaging systems, (5) land tenure systems, (6) sources of income and their utilization, and (7) types of farmers' organizations.

The program, moreover, recognizes that other policy instruments, outside the realm of agricultural research, must also be studied. Here the main issue is the efficiency of institutions such as the National Corporation for the Promotion of Agriculture (SONAPRA), the regional rural development centers (CARDER), the financial institutions, the NGOs, and the seaport facilities. The Beninese Center for Scientific and Technical Research (CBRST) must contribute to these efficiency evaluations.

While the agricultural policy analysis program might implicitly address food production issues, policy research on food production should become an explicit agenda item. Indeed food production and supply requirements are different from the needs associated with export crops such as cotton. If, as stated in the master plan, food is to receive priority attention, the issue of trade-offs will arise, and food policy research should assist in identifying those trade-off proposals that can reconcile food supply objectives with foreign-currency-earning and other socioeconomic goals.

Regional cooperation. The main purpose of regional cooperation is to secure a share of the ECOWAS market, which will offer about 380 million consumers in the year 2020. A competitive food system would ensure access to this market as well as international markets. Specific areas of regional cooperation can enhance the competitiveness of each nation's food system. These areas include commodity research, research on natural resource management, and technology generation and transfer. Collaboration of this kind will make optimum use of scarce human and financial resources at the national level.

Benin should also play an active role in the integration of national and regional markets by increasing the usefulness of its road network to the regional transport systems. It must contribute as well to the effective operation of the ECOWAS and UEMOA trade liberalization schemes that are under implementation. Regional food supply and food security master plans would further the economic well-being of West African states. Benin should take an active part in the establishment of such plans.

CONCLUSION

Today no significant gap between food supply and demand exists in Benin. Yet the national food basket is not accessible to all segments of the population. Some parts of Benin have been unable to grow enough food. Equally important, inadequate income generation and distribution causes one-fifth of the nation's population to be extremely poor and one-third to be poor. If the poor are to have access to adequate food, the government must vigorously promote income-generating activities, especially in the rural areas.

Irrespective of the impact that additional income may have on the demand for food, Benin minimally must double its food crop production to meet its food requirements in 2020. That objective must be achieved while preserving the natural resource base and allowing the existing ecosystems to function properly. To achieve sustainable production increases, on-farm food production methods will have to be improved and off-farm food and nonfood supplies and services will have to be provided.

Large productivity gains from major improvements in crop yields will be necessary. The overall food system can also be enhanced by lowering the transaction costs of food commodities. The food system should also take into account the regional market, because Benin belongs to a wider economic system, ECOWAS.

The challenge posed by the need to provide adequate food to the population of Benin in 2020 calls for policy measures that support rural development and agricultural research. The challenge also requires action that takes advantage of regional cooperation.

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